

Application No. 10/544,120
Paper Dated: May 6, 2009
In Reply to USPTO Correspondence of February 6, 2009
Attorney Docket No. 0388-051649

AMENDMENTS TO THE DRAWINGS

The Replacement Sheet includes changes to Fig. 5. This sheet, which includes Fig. 5, replaces the original sheet including Fig. 5. The New Sheet includes newly added Fig. 6.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes
New Sheet

REMARKS

This Amendment is responsive to the Office Action dated February 2, 2009. Claims 9-15 and 17-19 stand rejected and claim 16 has been withdrawn from further consideration. Claims 9-11 and 14 have been amended and claim 15 has been cancelled. The specification and drawings have also been amended. Support for the amendment to claim 9 may be found, for example, in the originally-filed specification at page 5, lines 12-20 and in Figs. 1-3. Support for the amendment to claim 14 may be found, for example, in the specification at page 9, lines 7-10. Support for the newly added Fig. 6 may be found, for example, in the specification at page 17, lines 6-9. Claims 9-14 and 16-19 are now pending in this application.

Drawing Objections

The Examiner has objected to Fig. 5 for not including a designation of "Prior Art." Fig. 5 has been amended to include a designation of "Prior Art."

Referring to pages 3-5 of the Office Action, the Examiner has objected to the drawings for using multiple reference characters to designate the same element. However, the diaphragm B is formed by etching the polycrystal silicon film 304. The back electrode C is formed by etching the polycrystal silicon film 306. The spacer D is formed by etching the sacrificial layer 205. Thus, the diaphragm B is formed from the polycrystal silicon film 204, the back electrode C is formed from the polycrystal silicon film 306, and the spacer D is formed from the sacrificial layer 305. Accordingly, these components are separate members formed from different respective films and the use of separate characters to designate these separate members is acceptable.

Referring to pages 6-8 of the Office Action, the Examiner has objected to the drawings for not showing features specified in the claims. With respect to the term "SOI wafer" used in claims 10 and 11, Applicants respectfully submit that a Silicon on Insulator (SOI) wafer is already sufficiently shown in Figs. 2 and 3 of the present application. With respect to the term "active layer" in claim 10 ("the silicon nitride film held between an active layer and a built-in oxide film layer"), Applicants respectfully submit that the "active layer" corresponds to the polycrystal silicon film, as discussed in the specification, and is already

sufficiently shown in Figs. 2 and 3. With respect to the phrase “the silicon nitride film held between a built-in oxide film layer and the base is used as the support substrate”, Applicants have amended the drawings to add Fig. 6 showing this feature.

In view of the above, reconsideration and withdrawal of these objections are respectfully requested.

Specification Objection

The Examiner has objected to the specification for not describing the term “SOI.” Applicants respectfully submit that the term “SOI” or Silicon on Insulator is a well-known term in the art. The specification has been amended at the first mention of the term “SOI” to read “SOI (Silicon on Insulator)”. Reconsideration and withdrawal of this objection are respectfully requested.

Double Patenting Rejections

Claim 9 is provisionally rejected under 35 U.S.C. § 101 as claiming the same invention as that of claim 14 of co-pending Application No. 10/565,059. Further, claims 9 and 10 stand rejected under 35 U.S.C. § 101 as claiming the same invention as that of claims 1, 4 and 5 of United States Patent No. 7,386,136.

A statutory double patenting rejection under 35 U.S.C. § 101 is appropriate when the same invention, *i.e.*, identical subject matter, is being claimed twice. See MPEP § 804. Claim 9 of the present application recites:

“A sound detecting mechanism comprising a pair of electrodes forming a capacitor on a substrate in which one of the electrodes is a back electrode forming perforations therein corresponding to acoustic holes and the other of the electrodes is a diaphragm, wherein a silicon nitride film is provided between a side adjacent a base of the substrate and a membrane acting as the diaphragm formed on the substrate.”

Accordingly, in the claimed invention, the silicon nitride film is interposed between the substrate and the diaphragm. Claim 14 of co-pending Application No. 10/565,059 does not recite this feature. As indicated in the Office Action at page 9, claim 9 of the present application includes elements and subject matter that is different from claim 14 of co-pending Application No. 10/565,059, *i.e.*, the elements that are not bolded in the Office Action. Similarly, claims 1, 4 and 5 of United States Patent No. 7,386,136 do not recite all of the features of claim 9 of the present invention as indicated by the elements that are not bolded on pages 10 and 11 of the Office Action. Further, claim 10 of the present invention depends from and includes all of the limitations of claim 9 and, therefore, claims 1, 4 and 5 of United States Patent No. 7,386,136 also do not recite all of the limitations of dependent claim 10.

Accordingly, the same invention is not being claimed twice as asserted in the Office Action, but rather includes limitations different from that claimed in co-pending Application No. 10/565,059 and United States Patent No. 7,386,136. Therefore, the statutory double patenting rejection of claims 9 and 10 under 35 U.S.C. § 101 is improper. Reconsideration and withdrawal of these rejections are respectfully requested.

Claim Objections

Claim 15 is objected to under 37 C.F.R. 1.75(c) for failing to further limit the subject matter of a previous claim. Claim 15 has been cancelled.

Claims 10 and 11 have been objected to due to the term "SOI". The Examiner asserts that the phrase "single crystal silicon on insulator" should be inserted before "SOI" in these claims. In view of the above amendments to claims 10 and 11, reconsideration and withdrawal of this objection are respectfully requested.

Rejections Under 35 U.S.C. § 112, second paragraph

Claims 9-15 and 17-19 stand rejected under 35 U.S.C. § 112, second paragraph, for indefiniteness. As indicated above, claim 15 has been cancelled.

The Examiner appears to assert that the term "substrate" and "silicon film" in claims 9 and 12, respectively, are generic relative to the embodiments disclosed in the

specification. Applicants respectfully submit that having claim terms that are generic to the embodiments disclosed in the specification is acceptable. Further, the terms "substrate" and "silicon film" are sufficiently described in the specification of the present application. Therefore, claims 9-14 and 17-19 are sufficiently definite and in accordance with 35 U.S.C. § 112, second paragraph.

Claim 14 has been amended to read "a silicon substrate of (100) orientation", which is described in the originally-filed specification at page 9, lines 7-10.

Reconsideration and withdrawal of these rejections are respectfully requested.

Rejections Under 35 U.S.C. §§ 102 and 103

Claim 9 stands rejected under 35 U.S.C. § 102(b) for anticipation by United States Patent No. 5,490,220 to Loeppert (hereinafter "Loeppert"). Claims 10-15 and 17-19 stand rejected under 35 U.S.C. § 103(a) for obviousness over Loeppert. In view of the foregoing amendment and the following comments, reconsideration of these rejections is respectfully requested.

Loeppert fails to disclose or suggest a silicon nitride film provided between a side adjacent a base of the substrate and a membrane acting as the diaphragm formed on the substrate as recited in independent claim 9.

Loeppert discloses a microphone device constructed as follows. On the front and back faces of a (100) oriented silicon wafer 14, a first oxide layer 16 and a second oxide layer 18 are formed. On the first oxide layer 16, a first aluminum layer 20 made of polycrystal silicon is formed and then a first silicon nitride layer 24 is deposited thereon. The first silicon nitride layer 24 is etched, thereby forming a diaphragm 12. The diaphragm 12 is formed from silicon nitride and on this, a second aluminum layer 26 made of polycrystal silicon is formed. The first aluminum layer 20 and the second aluminum layer 26 are etched in such a manner as to cover the periphery of the first silicon nitride layer 24. Further, in a "step" formed by this etching, a second silicon nitride layer 30 is formed. Thereafter, the first aluminum layer 20 and the second aluminum layer 26 are etched. Separately from the above product, a backplate 64 is made which includes a plurality of perforations 60 formed by etching a silicon substrate 68. A connecting layer (44) is formed on the diaphragm (12) to

connect the diaphragm with other circuitry on the wafer (14). The "step" of the second silicon nitride layer 30 and the silicone substrate 68 formed with the backplate 64 are bonded together.

Accordingly, in the arrangement of Loeppert, a further silicon nitride film is not interposed between the silicon substrate 14 and the silicon nitride layer 24 forming the diaphragm 12. This is also the case with the embodiment shown in Fig. 7 of Loeppert. As shown in Fig. 1a of Loeppert, the substances present on the opposed sides of the silicon nitride layer 24, which forms the diaphragm 12, are different from the claimed invention. For example, in one embodiment of present invention, the silicon nitride film 303 is formed between the membrane B made of polycrystal silicon layer and the silicon oxide film 302 formed on the monocrystal silicon substrate 301. Thus, Loeppert fails to disclose a silicon nitride film provided between a side adjacent a base of the substrate and a membrane as recited in independent claim 9. Contrary to the position asserted in the Office Action, the connecting layer (44) of Loeppert is not a membrane acting as a diaphragm, but rather is formed on the diaphragm (12) to connect the diaphragm with other circuitry on the wafer (14). Therefore, for at least the foregoing reasons, Loeppert fails to disclose all of the limitations of independent claim 9.

With respect to the rejection of dependent claim 10, Applicants respectfully submit that Loeppert fails to teach or suggest where the active layer forms the diaphragm. As discussed above, the first silicon nitride layer 24 of Loeppert is etched to form the diaphragm 12. Accordingly, Loeppert fails to teach or suggest an active layer, such as polycrystal silicon film for example, as the material forming the membrane as recited in dependent claim 10.

Claims 10-14 and 17-19 depend from, and add further limitations to, independent claim 9, and are believed to be patentable for the reasons discussed hereinabove in connection with independent claim 9.

Application No. 10/544,120
Paper Dated: May 6, 2009
In Reply to USPTO Correspondence of February 6, 2009
Attorney Docket No. 0388-051649

Conclusion

In view of the foregoing comments and amendments, reconsideration of the objections and rejections and allowance of claims 9-14 and 17-19 are respectfully requested.

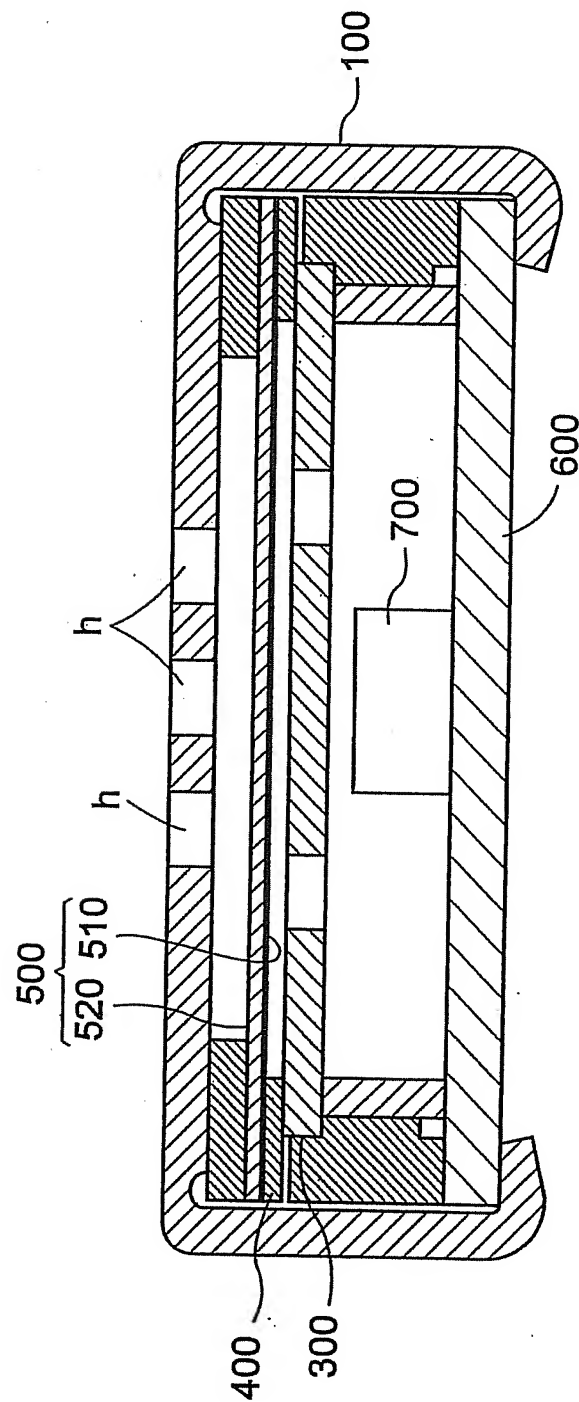
Respectfully submitted,
THE WEBB LAW FIRM

By



Adam J. Komorowski
Registration No. 62,575
Attorney for Applicants
436 Seventh Avenue
700 Koppers Building
Pittsburgh, PA 15219
Telephone: (412) 471-8815
Facsimile: (412) 471-4094
E-mail: webblaw@webblaw.com

FIG.5



(PRIOR ART)